November 7, 1966

Mr. D. Locklin
Battelle Memorial Institute
Columbus Laboratories
505 King Avenue
Columbus 1, Ohio

Re: WORLD TRADE CENTER - Stack Effect and Related Studies

192-53

Dear Dave,

This will summarize the two meetings held on October 25, 1966 in New York City concerning the studies by Battelle on Column Temperature Stability and Stack Effect. The proceedings of the two meetings are described separately in the following paragraphs.

Column Temperature Stability

Purpose - The purpose of the meeting was to have Battelle make an oral presentation of the study.

Attendance - Messrs. Levy, DiPaolo, Tessler, Feld, Robertson, Solomon, Panero, Cox, Locklin, Barrett, Chronis.

Results - 1. Mr. Locklin said that the analysis phase of the study was complete and presented the results orally with the help of charts.
2. The fire-proofing/insulation schemes examined by Battelle were based on Dwg. SK-M-A-72 dated June 23, 1966 and accompanying tabulation previously transmitted to Battelle.
3. The most favorable scheme examined by Battelle is described below. The results are based on a column at the 105th floor with the following assumed environment: 0° cloudy day, 74° inside temperature, 78° ceiling temperature.

Encl. of D. DiPaolo
5/24/67

PA LAW DEPARTMENT
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	At Column	At Spandrel
Inside Materials	Cover + Air Space + 1 3/8" gypsum	1 3/8" gypsum
Outside Materials, side	Cover, 3/8" urethane, 1 5/8" spray craft	--
Outside Materials, front	Cover, 3/4" urethane, 2" spray craft	Cover + 3/4" urethane + air space + 1 5/8" spray craft
Temp. Difference (Inside Column - Outside Column)	17.0°F	15.4°F

4. The final written report from Battelle is expected on or about December 15, 1966.
5. The computer runs made by Battelle on this study can be made available to the Port Authority in connection with determining the performance of alternate fireproofing/insulation schemes.
6. Battelle indicated that their services would be available, under a new agreement with the Port Authority, for computing the thermal performance of proposed curtain wall designs and for participating in the testing of these designs.

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Stack Effect

Purpose - The purpose of this meeting was mainly to provide further information required by Battelle for the Stack Effect study.

Attendance - Messrs. Levy, Tessler, DiPsolo, Lim, Panero, Solomon, Draiss, Baum, Locklin, Barrett, Chronis

Information - The following information was given to Battelle:

1. Dwgs. SK-A-J-205 thru 206 Revision #3, showing all areas below Elev. 310 in and around Tower A, including stairways, elevators, motorized air-locks, double door vestibules and the functions of the occupied areas.
2. Battelle is to assume that supply air to the occupied areas within the tower is at the rate of 1 CFM/SF of which 75% is fresh air and 25% return air, and that transfer fans are used to move the vitiated 75% component to the surrounding tenant storage areas.

3. The proportion of time spent by shuttle elevators at the main lobby, en route and at the skylobbies is shown on the attached tabulation.
4. Battelle is to assume that MER louver walls are as tight as typical tower walls.
5. Dwg. AA-320 showing proposed vestibule doors at each MER leading to the annular space. Two vestibules will be used per MER.
6. Battelle is to assume that each stairway will have 2 interrupting doors per skylobby.
7. Tabulation dated 10/25/66 indicating the Sturtevant fan model numbers corresponding to the HVAC system tabulations previously transmitted to Battelle.
8. Battelle is to assume that elevator pit doors can be made air-tight.

Questions - Battelle was asked to furnish the following information as soon as possible:

1. Design details required to facilitate the operation of the MER vestibule doors.
2. A rationale for the need of vestibule entrance doors instead of single entrance doors at Elevs. 310 and 332.
3. The approximate outdoor temperature when the overhead doors at Elev. 294 can be used and air locks discontinued.

Sincerely,

F. DiPaolo
Planning Engineer

cc: Messrs. Baum, Dreiss, Robertson, Schreier, Solomon

bcc: Messrs. Goz, Levy, Linn, Panero, Sullivan, Tessler, Tozzoli

FD:jw